

Evolution of the CMDL Frostpoint Hygrometer, 1998 to Present

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Designed in 1956, the CMDL frostpoint hygrometer remained mostly unchanged until 1998. Difficult assembly practices and obsolescence of parts prompted incremental design changes, culminating in a recent overhaul of electronics and mechanical assembly (Figure 1). Basic optical and thermodynamic elements have remained unchanged. The current revision provides a 400% increase in battery efficiency, a 60% reduction in weight, a 50% reduction in cost, a faster assembly time, precision components, and a sophisticated controller. The hygrometer connects directly to an ozonesonde providing 1-second resolution of simultaneous ozone and water vapor data with integrated global positioning system (GPS) capability. The delivery system was also updated to reduce weight and cost. This poster will document design changes since 1998 and evaluate the impact of the changes in terms of cost, weight, and performance.

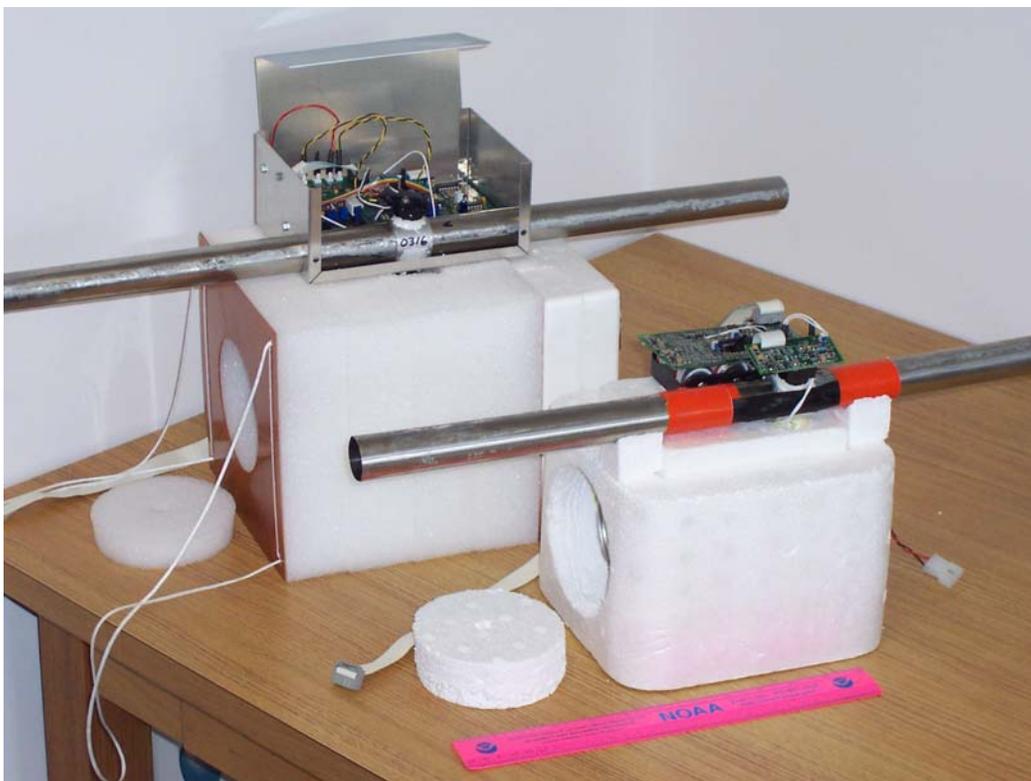


Figure 1. Two CMDL frostpoint hygrometers. The instrument on the right is the latest revision. It is lighter in weight, has a lower-cost, and is more precise than its predecessor.